Loop-O9400S
SDH/SONET ADM/TM

Features

- 1U height, full front access (ETSI) unit
  - 1US1 shelf STM-1 (OC-3)
  - 1US4 shelf STM-1/4 (OC-3/12)
- Rack mount, wall mount, and stand-alone
- Aggregate Lines
  - STM-1 (OC-3) software configurable
  - STM-1/4 (OC-3/12) software configurable
  - Two hot-swappable aggregate lines
- On-board tributaries on TG1 slot
  - Up to 16 E1 (120 ohm)/T1
  - Up to 16 E1 (75 ohm)
- Fixed tributary modules on TG2 and TG3 slots
  - Up to two 16 E1 (120 ohm)/T1 tributary modules
  - Up to two 16E1 (75 ohm) tributary modules
  - Up to six E3/T3 tributary modules (for 1US4 only)
  - Up to one 1 GbE and 3 FE EoS module with L2 switch (for 1US4 only)
  - Up to two 1 GbE or 4 FE EoS module without L2 switch
- Power Modules
  - Two hot-swappable DC plug-in modules (-36 to -75 Vdc)
  - Single AC plug-in module (90 to 240 Vac)
  - AC and DC (coexistent) fixed module (90 to 240 Vac / -36 to -75Vdc)
- Two RS232 Asynchronous
- Networking Protection
  - SNCP protection
  - MSP (1+1) protection for TM
- TM, ADM, cross-connect
- VC11/VC12/VC3/VC4 cross-connect
- External/Internal/Line timing with SSM
- Supports VCAT, LAPS, GFP, BCP, LCAS, and non-LCAS
- Supports jumbo frame note 1
- Performance monitoring
- Alarm suppression, masking, and reporting
- Ethernet Order Wire (EOW) using VoIP technology
- Management:
  - Console Port, VT-100 menu-driven; SNMP Port
  - Centralized management with Loop's EMS/iNMS over DCC channel
  - LoopView GUI EMS (Element Management System)
  - Loop iNMS* with full FCAPS and end-to-end circuit management
  - Telnet support
  - SSH
- RoHS compliant

Description

The Loop-O9400S ADM/TM is a compact, economic STM1/4 (OC-3/12) ADM & TM multiplexer designed to add and drop up to note 2.

1US1 shelf STM-1(OC-3)
- 48 E1/T1 tributaries
- 2 GbE tributaries
- 8 FE tributaries

1US4 shelf STM-1/4(OC-3/12)
- 48 E1/T1 tributaries
- 6 E3/T3 tributaries
- 2 GbE tributaries
- 8 FE tributaries

With up to two aggregate STM-1/4 (OC-3/12) interfaces, the Loop-O9400S can offer the service provider a versatile protection scheme including SNCP and MSP (1+1) protection for both ring and linear network topology.

All interfaces are fully compliant with the relevant ETSI standards and ITU recommendations. The Loop-O9400S provides powerful OAM&P (Operation, Administration, Maintenance and Provisioning) functionality, including fault management, performance monitoring, configuration management, and network security management. Through the console port, LAN port, Inband E1 and DCC channel, the OAM&P can be achieved both locally and remotely via SNMP or menu-driven interfaces.

Powerful SDH Loop's EMS/NMS
The Loop-O9400S provides a complete set of operation interfaces that are consistent with the Telecommunication Management Network (TMN) concept (ITU Recommendation M.30, G.784) for SDH/SONET Network Element/Operations System (NE/OS), NE/NE, and NE/Craft communications. Users can easily operate the Loop-O9400S both locally or remotely for centralized management.

Note 1: Enquire Loop for detail.
Note 2: Detail on Tributary Type and Capacities are found on pages 14 and 15.

* Future option

Ordering Information

To specify options, choose from list below:

Note: All O9400S units, plug-in modules and accessories are RoHS compliant.
If a different environment requirement is needed, please contact Loop's Sales team regarding availability.

Model	Description	Note
Main Unit		
Loop-O9400-S-1US4-agg1-agg2-tg1-tg2-tg3-pp1-pp2-**G**	1U height shelf with STM-1/4(OC-3/12) engine	
Loop-O9400-S-1US1-agg1-agg2-tg1-tg2-tg3-pp1-pp2-**G**	1U height shelf with STM-1(OC-3) engine	
Plug-in Card		
Loop-O9400-S-SFPC-**G**	SFP (mini-GBIC) housing plug-in card without SFP module	Order one or two cards

Accessories

SFP Optical Modules		
Please place your order using the 5-digit alphanumeric codes listed in the separate SFP Optical Module Brochure.		
User's Manual		
Loop-O9400-S-UM-1US4	Optional, paper copy of User Manual. A CD version of the manual is already included as standard package.	
Loop-O9400-S-UM-1US1	Optional, paper copy of User Manual. A CD version of the manual is already included as standard package.	
Power Cord		
Loop-ACC-PC-USA	AC power cord for Taiwan/America	
Loop-ACC-PC-EU	AC power cord for Europe	
Loop-ACC-PC-UK	AC power cord for UK	
Loop-ACC-PC-AUS	AC power cord for Australia	
Loop-ACC-PC-CH	AC power cord for China	
Order wire phone		
Loop-O9400-S-OW-**G**	Order Wire (VoIP) Phone	
SIP Proxy Server		
Loop-O9400-S-SIP	SIP Proxy Server Basic Software **Note:** One SIP proxy server license supports up to 25 phone lines. For phone lines exceeding 25, you need to purchase additional licenses for each increment of 25 lines.	Customer must provide a MAC address so that a license key can be generated to operate the software at that address.
Conversion Panels		
Loop-ACC-P-1SCSI-16RJ-**G**	One SCSI to sixteen RJ (1u height) without cable; 432x44x23mm (WxHxD)	
Loop-ACC-P-1SCSI-16WW-**G**	One SCSI to sixteen Wire Wrap (1u height) without cable; 432x44x40mm (WxHxD)	
Loop-ACC-P-1SCSI-16BNC-**G**	One SCSI to sixteen BNC (1.5u height) without cable; 432x66x53mm (WxHxD)	
Conversion Cable		
Loop-ACC-CAB-SCSI68M-200-1SCSI68M-**G**	SCSI68/Male to one SCSI68/Male; Length 200 cm	Used for all Conversion Panels
Ear Mounts		
19"/23'' ear mounts	A pair of 19"/23" ear mounts is supplied as part of standard package. **Note**: For other sizes, please contact your nearest Loop sales representative.	

■ where **agg1** and **agg2** are used to select aggregation line type:

SFPC	SFP (mini-GBIC) housing plug-in card without SFP module	Order SFP modules separately from SFP module brochure.

■ where **tg1** is manufacture option used to select T1/E1 type for the Tributary Group1 (TG1) slot (must select one)

tg1=	Description	Note
8TE	8 T1/E1(120 ohm) on board	
8E75	8 E1(75 ohm) on board	
16TE	16 T1/E1(120 ohm) on board	
16E75	16 E1(75 ohm) on board	

■ where **tg2** is manufacture option used to select a daughter card for the Tributary Group2 (TG2) slot:

tg2=	Description	Note
16TE	16 T1/E1(120 ohm) daughter card	
16E75	16 E1(75 ohm) daughter card	
3TE3	3 E3/T3 daughter card with RF connector 1.0/2.3 (75-ohm impedance)	1US4 version only
1GE4NSW	1 GbE over 155/622 Mbps SDH/SONET signal daughter card without L2 switch.	- The SA power option **CAN NOT** be used if you selected a **1GE4NSW** or a **4FE4NSW** daughter card as a **tg2** option **AND** a **4EoS6SW** or a **4EoS1SW** daughter card as a **tg3** option.
4FE4NSW	4 FE over 155/622 Mbps SDH/SONET signal daughter card without L2 switch.	

■ where **tg3** is manufacture option used to select a daughter card for the Tributary Group3 (TG3) slot:

tg3=	Description	Note
16TE	16 T1/E1(120 ohm) daughter card	
16E75	16 E1(75 ohm) daughter card	
4EoS6SW	Ethernet Switch Daughter card with 4 LAN (1 GbE and 3FE) and 1 GbE WAN mapped to 155/622 Mbps SDH/SONET (EoS)	- Available for 1US4 version only. - The SA power option **CAN NOT** be used if you selected a **1GE4NSW** or a **4FE4NSW** daughter card as a **tg2** option **AND** a **4EoS6SW** or a **4EoS1SW** daughter card as a **tg3** option.
4EoS1SW	Ethernet Switch Daughter card with 4 LAN (1 GbE and 3FE) and 4/8 FET WANs mapped to 155/622 Mbps SDH/SONET (EoS)	
1GE4NSW	1 GbE over 155/622 Mbps SDH/SONET signal daughter card without L2 switch	
4FE4NSW	4 FE over 155/622 Mbps SDH/SONET signal daughter card without L2 switch	
3TE3	3 E3/T3 daughter card with RF connector 1.0/2.3 (75-ohm impedance)	1US4 version only

■ where **pp1** is used to select 1st power supply:

pp1 =	Description	Note
AD	AC and DC (co-existent) fixed, power module (90 to 240 Vac / -36 to -75Vdc)	-AD is a fixed power supply. If you order AD then you cannot select any items for pp2 -For AC power module choose an appropriate power cord
SA	Single AC plug-in power module (90 to 240 Vac, 50/60Hz)	-If you order SA then you cannot select any items for pp2 - **CAN NOT** be used if you selected a **1GE4NSW** or a **4FE4NSW** daughter card as a **tg2** option **AND** a **4EoS6SW** or a **4EoS1SW** daughter card as a **tg3** option. -For AC choose an appropriate power cord
SD48	Single, hot-swappable DC plug-in power module -48 Vdc	-Can order up to two power modules for

pp1 =	Description	Note
	(-36 to -75Vdc)	Redundancy

■ where **pp2** is used to select 2nd power supply:

pp2 =	Description	Note
SD48	Single, hot-swappable DC plug-in power module -48 Vdc (-36 to -75Vdc)	-Can order up to two power modules for Redundancy

SA Power option for Ethernet Cards Reference Table

SA power option

TG2	TG3
16TE, 16E75, 3TE3(1US4 only)	4EoS6SW, 4EoS1SW
16TE, 16E75, 3TE3(1US4 only), 1GE4NSW, 4FE4NSW	16TE, 16E75, 3TE3(1US4 only), 1GE4NSW, 4FE4NSW

Comparison of Slots between 1US1 and 1US4

	1US1	1US4
Tg1	8TE/8E75/16TE/16E75	the same with 1US1
Tg2	Does not support 3TE3	All
Tg3	Does not support 3TE3, 4EoS6SW, and 4EoS1SW	All

Loop-O9400S SDH/SONET ADM/TM Product Specifications

SFP Module Characteristics (please refer to SFP optical module brochure for detail)

Max. Number of Cross-Connect Modules

1US1 Shelf STM-1 (OC-3)	2 STM-1 (OC-3) aggregate lines
1US4 Shelf STM-1/4 (OC-3/12)	2 STM-1/4 (OC-3/12) aggregate lines

Max. Number of Tributary Modules

1US1 Shelf STM-1 (OC-3)	48 E1/T1 tributaries 2GbE tributaries 8FE tributaries
1US4 Shelf STM-1/4 (OC-3/12)	48 E1/T1 tributaries 2 E3/T3 tributaries 2 GbE tributaries 8 FE tributaries

Tributary Modules

E1 Interface

Line Rate	2.048 M bps ± 50 ppm	Output Mask	ETS 300 689 Sec.4.2.1.2 ITU G.703
Line Code	AMI/HDB3	Jitter	ITU G.823
Input Signal	ITU G.703	Framing	Unframed
Output Signal	ITU G.703	Impedance	75 ohm coax/120 ohm twisted pair
		Connector	One SCSI-II 68-pin

T1 Interface

Line Rate	1.544 M bps ± 32 ppm	Output Mask	Bellcore GR-499-core
Line Code	AMI/B8ZS	Jitter	ITU G.824
Input Signal	DSX-1 0dB to –6dB w/ALBO	Framing	Unframed
Output Signal	DSX-1 w/short haul (0-133, 133-266,266-399, 399-533, 533-655 feet)	Impedance	100 ohm
		Connector	One SCSI-II 68-pin

E3 Interface

Line Rate	34.368 M bps ± 20ppm	Output Mask	ETS 300 689 Sec.4.2.1.2 ITU G.703
Line Code	HDB3	Jitter	ITU G.823
Input Signal	ITU G.703	Framing	Unframed

Output Signal	ITU G.703	Connector	RF connector 1.0/2.3 (75-ohm impedance)
		Impedance	75 ohm coax

T3 Interface

Line Rate	44.736 M bps ± 20ppm	Output Mask	Bellcore GR-499-core
Line Code	B3ZS	Jitter	ITU G.824
Input Signal	ITU G.703	Framing	Unframed
Output Signal	ITU G.703	Connector	RF connector 1.0/2.3 (75-ohm impedance)
		Impedance	75 ohm coax

RS232 Interface

Rate	up to 19.2K bps, Asynchronous	Connector	Two ports in one DB9, female

Fast Ethernet (FE) interface

Line Rate	10/100M bps	Mapping	n x VC12, n x VC11, n x VC3 or n x VC4
Layer2 Protocol	RSTP (802.1w), VLAN (802.1q, 802.1p) Flow Control (802.3x) MSTP (802.1s) IGMP Snooping (RFC2236) QoS (802.1p)	Connector	RJ45
Process Protocol	VCAT, GFP(G.7041), LAPS, BCP, LCAS(G.7042), and non-LCAS		

Gigabit Ethernet (GbE) interface

Line Rate	10/100/1000Mbps (1GE4NSW only supports 1000Mbps)	Mapping	n x VC12, n x VC11, n x VC3 or n x VC4
Layer2 Protocol	RSTP (802.1w), VLAN (802.1q, 802.1p) Flow Control (802.3x) MSTP (802.1s) IGMP Snooping (RFC2236) QoS (802.1p)	Connector	RJ45
Process Protocol	VCAT, GFP(G.7041), LAPS, BCP, LCAS(G.7042), and non-LCAS		

System Clock

Clock Source	Internal clock 2 aggregate lines clocks (East STM-1/4 (OC-3/12), West STM-1/4 (OC-3/12)) 3 tributary clocks 1 external input and output clock (2.048 MHz of ITU-T G.703 or E1 for STM-1/4, T1 for OC-3/12)

Management

LEDs	Multi-color LEDs
Console port	Electrical: RS232 Connector: DB9S (female, DCE) Protocol: Menu driven VT-100
Telnet	
SNMP	SNMPv1 (RFC1213)
Inband interface	Using 1 E1
Outband interface	Using DCC channel, user selectable 3, 9 or 12 channels

Diagnostics

Mainboard

Loopback Test	Direction: to optical lines, to tributary lines	
BERT Test	Optical interface	Direction: to optical lines

TE1 card

Loopback Test	Direction: to optical lines, to tributary lines	
BERT Test	TE1 interface	Direction: to optical lines, to tributary lines

TE3 card

Loopback Test	Direction: to optical lines, to tributary lines	
BERT Test	TE3 interface	Direction: to optical lines, to tributary lines

Performance Monitor

Performance Reports	Performance Parameters: Error Block (EB), Background Block Error (BBE), Error Second (ES), Burst Error Second (BES), Severe Error Second (SES), Unavailable Second (UAS)			
Alarm History	System Alarm	Alarm Cut Off, Power Loss, TS Sync Loss, SNCP Switch, MSP Switch, Login/Logout, FOM Equip/Unequip, SFP Tx Fail, SFP Rx Fail, SFP Temperature		
	SDH/SONET Line Alarm	SDH	Line	PI-LOS, RS-LOF, RS-TIM, RS-BIP UAS, MS-SD, MS-SF, MS-AIS, MS-RDI, MS-BIP UAS, MS-REI UAS,
			Ho-Path	AU-LOP, AU-AIS, HP-SD, HP-SF, HP-TIM, HP-UNEQ, HP-PLM, HP-RDI-S, HP-RDI-C, HP-RDI-P, HP-BIP UAS, HP-REI UAS, LOM
			Lo-Path	TU-LOP, TU-AIS, LP-SD, LP-SF,
		SONET	Line	LOS-PI, LOF-S, TIM-S, BIP-S UAS, SD-L , SF-L , AIS-L , RDI-L , BIP-L UAS, REI-L UAS
			STS-Path	LOP-P, AIS-P, SD-P, SF-P, TIM-P, UNEQ-P, PLM-P, RDI-S-P, RDI-C-P, RDI-P-P, BIP-P UAS, REI-P UAS, LOM
			VT-Path	LOP-V, AIS-V, SD-V, SF-V
Alarm Queue	Contains up to 200 alarm records of latest alarm types, alarm severity, date and time.			

Alarm Input/Output

Inputs

Channel	4
Connector	RJ45
Internal Resistance	1K
Activation Current	3 ma
Deactivation Current	1.5 ma
Allowable Current	4 ma

Outputs

Channel	4
Connector	RJ45
Initial Insulation Resistance	Min. 100M ohm (at 500Vdc)
Maximum switching voltage	110 V DC, 125 V AC

Power

AC module	100 to 240 Vac, 50/60Hz	
DC module	-48 Vdc (-36 to -75 Vdc)	
AC and DC coexistent module	100 to 240 Vac, 50/60Hz, -36 to -75 Vdc	
Power Consumption	Loop-O9400S-1US1	DC: Max 24.6 W AC: Max 25.7 W DC & AC: Max 27.5 W
	Loop-O9400S-1US4	DC: Max 39.6 W AC: Max 43.9 W DC & AC: Max 47.1 W

Physical and Environmental

Dimensions for 1u	432 x 44 x 240 mm. (W x H x D)
Temperature	0 to 50°C
Humidity	0-95%RH (non-condensing)
Mounting	19 inch rack mountable, and wall mountable

Standards Compliance

ITU	G.664, G.707, G.7041, G.7042, G.775, G.783, G.806, G.823, G.747, X.86
ANSI	T1.105, T1.107
IEEE	802.1q (VLAN), 802.1w (RSTP), 802.1s (MSTP), 802.1ad (stack VLAN), 802.3x (flow control), 802.1p (QoS)
IETF	RFC2236 (IGMP Snooping), RFC1213 (SNMPv1)

Certification

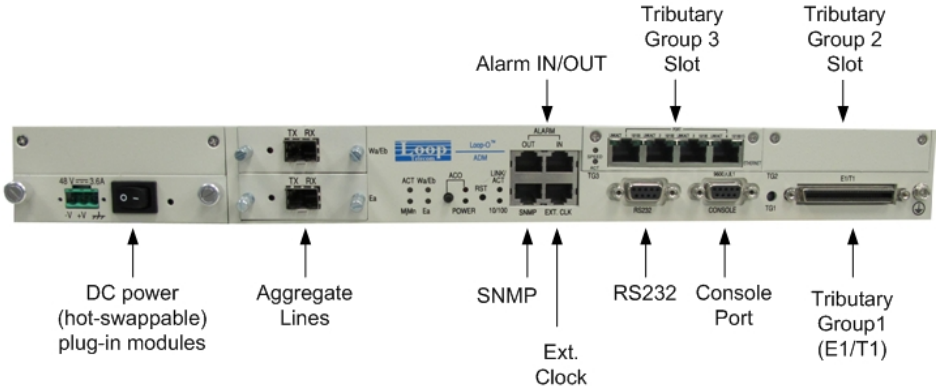
EMC	EN55024
EMI	EN55022 Class A, FCC Part 15 Class A, EN55024
Safety	EN60950-1, IEC60950-1

O9400S Front Panels

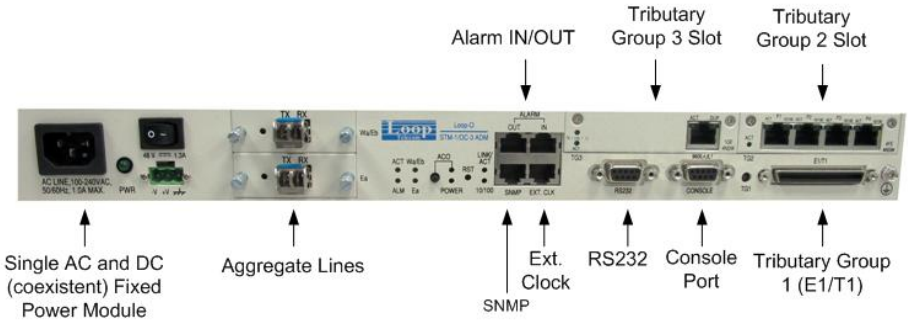
Single AC Power Plug-in Module

Single AC and DC (coexistent) Fixed Power Module

1US4



1US1



Panel View of Plug-in Cards

8TE/8E75/16TE/16E75

3TE3

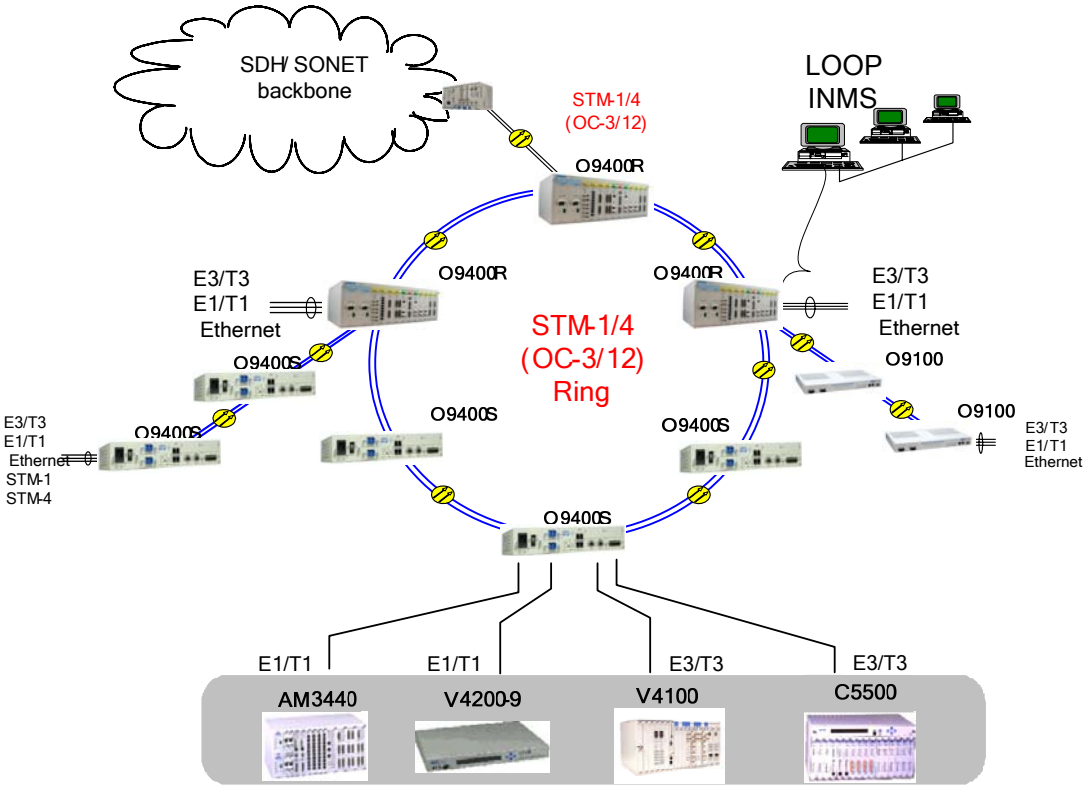
1GE4NSW

4FE4NSW

4EoS6SW

4EoS1SW

Application Illustration



Loop-O9400S Tributary Type and Capacity Reference Table

1US4

Slot / Max. Capacity	Tributary Group1 (TG1)	Tributary Group2 (TG2)	Tributary Group3 (TG3)
48 E1/T1	16 E1/T1	16 E1/T1	16 E1/T1
6 E3/T3	N/A	3E3/T3	3 E3/T3
2 GbE	N/A	1 GbE	1 GbE
8FE	N/A	4 FE	4 FE
1 GBE and 3 FE	N/A	N/A	1 GbE and 3 FE

Note: The maximum capacity of the tributary cards is one STM4.

1US1

Slot / Max. Capacity	Tributary Group1 (TG1)	Tributary Group2 (TG2)	Tributary Group3 (TG3)
48 E1/T1	16 E1/T1	16 E1/T1	16 E1/T1
2Gbe	N/A	1Gbe	1Gbe
8FE	N/A	4FE	4FE

Note: The maximum capacity of tributary cards is two STM1.

Loop-O9400S Aggregate Line and Capacity Reference Table

1US4

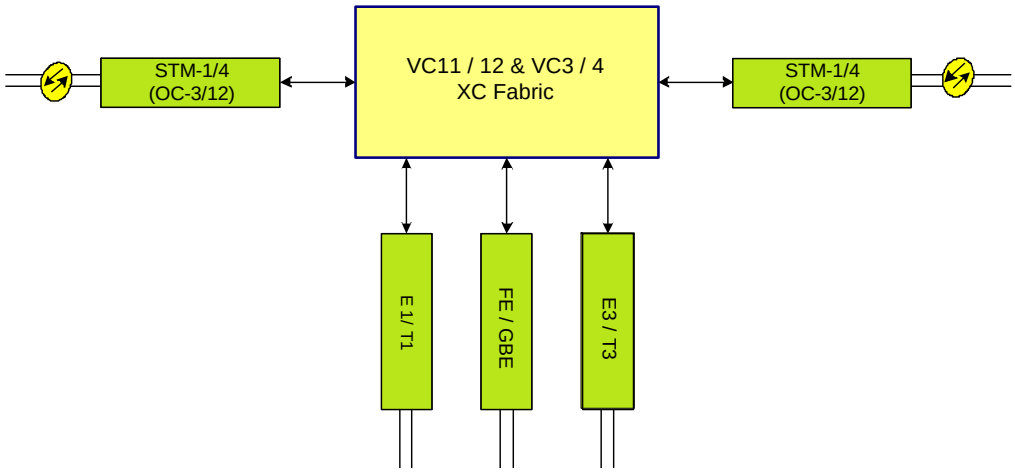
SLOT / Max. Capacity	Wa/Eb	Ea
2 STM-1/4 (OC-3/12) for ADM	STM-1/4 (OC-3/12)	STM-1/4 (OC-3/12)
2 STM-1/4 (OC-3/12) for TM (1+1)	STM-1/4 (OC-3/12)	STM-1/4 (OC-3/12)
2 STM-1/4 (OC-3/12) for 2 TM	STM-1/4 (OC-3/12)	STM-1/4 (OC-3/12)

1US1

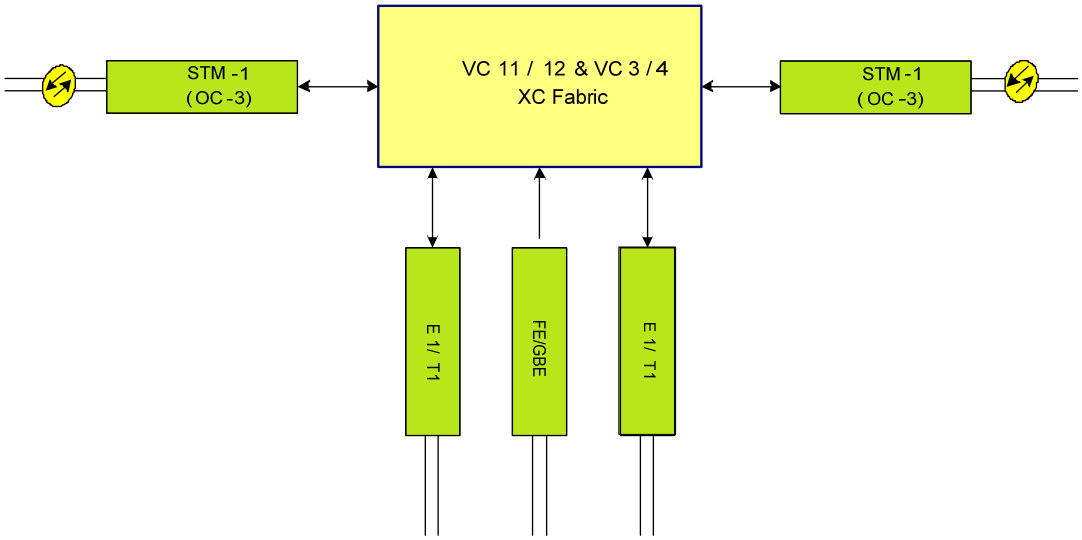
SLOT / Max. Capacity	Wa/Eb	Ea
2 STM-1 (OC-3) for ADM	STM-1 (OC-3)	STM-1 (OC-3)
2 STM-1 (OC-3) for TM (1+1)	STM-1 (OC-3)	STM-1 (OC-3)
2 STM-1 (OC-3) for 2 TM	STM-1 (OC-3)	STM-1 (OC-3)

Block Diagrams

1US4 Model



1US1 Model



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